Application No. 10/648,776
Reply to Office Action dated March 3, 2009, the Advisory Action dated June 30, 2009 and the
Notice of Appeal filed August 3, 2009

REMARKS

This communication is being filed in response to the final Office Action having a mailing date of March 3, 2009 and an Advisory Action having a mailing date of June 30, 2009. A Notice of Appeal was filed on August 3, 2009. All claims are in condition for allowance.

New claims 17-20 are added. No claims are currently amended or canceled. No new matter has been added to the application. Upon entry of this communication, claims 1-20 are pending. Reconsideration of the present application in view of the following remarks is respectfully requested.

I. Comment on Examiner's Telephone Interview Summary in the Advisory Action

In the present case, a telephone interview was held between Thomas J. Satagaj, an attorney at Seed Law Group, Examiner Mia Thomas, and Primary Examiner Andrew Johns on May 27, 2009. The interview was requested in order to advance the case toward allowance as quickly as possible.

To summarize the prosecution history of this application thus far, a first Office Action was mailed on August 4, 2008. A November 4, 2008 response described in the Remarks section how *Kalevo*, the NPL primary reference, failed to even teach the "sequence of images" element prominent in independent claim 1 or the first and second images recited in independent claim 15. Accordingly, even though several claim amendments were made in the November 4, 2008 response to <u>clarify</u> the claims, no substantive claim amendments were made. None of the clarifying amendments are believed to have changed the scope of the claims such that further searching was required.

The final Office Action now outstanding was mailed on March 3, 2009. In its Conclusion section, the Examiner stated that "Applicant's amendment necessitated the new ground(s) of rejection." Since no substantive claim amendments had been made in response to the first Office Action, and since Mr. Satagaj believed that the present claims did not read on any

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newly cited references, a telephone interview was requested to discuss the case with the
Examiner.

During the interview, Mr. Satagaj provided a brief explanation of the invention
for Examiner Thomas and Primary Examiner Johns. Additionally, Mr. Satagaj and the
Examiners discussed the how the claims were patentably different from the cited references. In
particular, it was understood that at least the claimed limitation of "selecting a second set of
pixels including pixels of the corresponding improved video image homologous with the pixels
of said first set of pixels" was not taught by the references. As a result of the interview, Mr.
Satagaj understood that the finality of the present Office Action would be withdrawn, and, with a
more complete grasp of the invention provided in the telephone interview, a new search would
be performed. Indeed, after two searches so far, neither of which has produced references that
teach all of the claim elements of the independent claims, Mr. Satagaj believed that a withdrawal
of finality and a new search were agreed to.

An Advisory Action mailed on June 30, 2009 states that Mr. Satagaj and the
Examiner drew different conclusions from the interview as to what was agreed. It is evident
from the Interview Summary that the disagreement only regards the prosecutorial course of
action that would follow the interview. That is, both Mr. Satagaj and the Examiner had already
agreed the cited references do not teach each of the elements of the present claims. Mr. Satagaj
further believed that a new, non-final communication would be forthcoming from the Office.
The Examiner did not. Accordingly, a Notice of Appeal was filed. Now, in order to more
quickly advance the case to allowance, a Request for Continued Examination (RCE) is filed
concurrently with this Amendment.

II. Request for Continued Examination

An RCE effectively makes non-final the final Office Action mailed March 3,
2009. Under 37 U.S.C. 1.114, the effect of the RCE, which makes the instant Office Action non-
final, is to cause examination of the instant application to remain open. Accordingly,

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amendments submitted herein are to be entered as a matter of right, and each claim is entitled to
continued examination, particularly with respect to the responses provided herein.

III. Rejections Under 35 U.S.C. § 112, Second Paragraph

Wither reference to the Advisory Action mailed on June 30, 2009, the Examiner
is thanked for the indication that the rejections made under 35 U.S.C. § 112 have been
withdrawn.

IV. Discussion of the claims and cited references

The present final Office Action rejects claims 1-16.

Claims 1, 13-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over
Bruls (U.S. Patent Publication No. 2002/0094130) in view of *Bagni et al.* (U.S. Patent No.
6,483,928).

Claims 2-4, 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over
Bruls, in combination with *Bagni*, in further view of *Gindele et al.* (U.S. Patent Publication No.
2003/0095717).

Claims 5-6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over
Bruls, in combination with *Bagni*, in further view of *Kalevo et al.* ("Noise Reduction
Techniques for Bayer-Matrix Images," Sensors and Camera Systems for Scientific, Industrial
and Digital Photography, Pages 348-359.

Claims 7-10, 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over
Bruls, in combination with *Bagni*, in further view of *Heimburger et al.* (U.S. Patent No.
5,490,094).

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Bruls*,
in combination with *Bagni*, in further view of *Heckman* (U.S. Patent Publication No.
2002/0164063).

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For the reasons set forth below, these rejections are respectfully traversed. It is therefore kindly requested that the rejections be reconsidered and withdrawn.

V. Rejections under 35 U.S.C. § 103

Respectful disagreement is made with the above rejections. It is believed that the present independent claims are clearly patentable and that all dependent claims are also patentable.

a. Claim 1

i. *Bruls* does not disclose several elements of Claim 1

Claim 1 is allowable for a number of reasons. The cited references fail to disclose, teach, or suggest the method for filtering the noise of a sequence of digital images required by Claim 1. For example, claim 1 is drafted such that the method for filtering comprises, "processing a first video image ..." and "processing at least one pixel of a second video image ...."

The processing of the first video image produces, *inter alia*, "a corresponding improved video image." The processing of the at least one pixel of the second video image includes, *inter alia*, "selecting a first set of pixels ... of the second video image ...," "selecting a second set of pixels ... of the corresponding improved video image ...," (which are provided from the first video image,) and "carrying out a digital filtering ...." To show these features, the final Office Action identifies *Bruls* Figures 1 and 2, and paragraphs [0005] along with *Bagni's* Figure 11 and Col. 7, Line 11.

The figures and paragraphs identified in the *Bruls* reference do not perform the steps recited in Claim 1. Basically, *Bruls* isolates a pixel, calculates statistics of the pixel, and

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applies the calculated statistics to the other pixels in the image. In particular, the passage of

Bruls' paragraph [0005] cited by the Examiner states that "statistics in at least one image are

determined ..., one filtered pixel is calculated from a set of original pixel values ..., and the

original pixel values are weighted under control of the statistics." *I.e., Bruls'* filtering occurs on

only a single image.

      With greater specificity, the final Office Action identifies and repeats the text of

Bruls' Paragraph [0005] to suggest a teaching of the Claim 1 element, "carrying out a digital

filtering." As stated above, however, the cited passage only describes an operation on the pixels

of one image. Accordingly, the cited passage does not teach the digital filtering recited in Claim

1 at least because *Bruls* does not use "pixels from said ... second video image and pixels from ...

the corresponding improved video image" that was produced from the first video image.

      In addition to *Bruls'* Paragraph [0005], Figures 1 and 2 of *Bruls* were identified as

teaching the Claim 1 element of "selecting a first set of pixels including the at least one pixel and

a plurality of pixels of the second video image spatially adjacent to the at least one pixel." *Bruls'*

Figure 1 illustrates an Encoder. As described in *Bruls'* Paragraph [0026], the Encoder passes a

set of Original Pixels $P_t M_i$ to a Computing Unit 11 where a Spread S is calculated. The Spread S

is used in a Lookup Table 12 and a Control Signal α is obtained. A Weighting Stage 13 applies a

weighting factor to the Original Pixels $P_t M_i$ to derive Weighted Pixel Values $P_t N_i$. The

Weighted Pixel Values $P_t N_i$ are processed in a Filter 14 to obtain a Filtered Pixel Value P_t'.

      Bruls' Figure 2, described in Paragraph [0027], shows input samples of a spatial

averaging filter of a type that could be provided in Filter 14 of *Bruls'* Figure 1. The dotted lines

of *Bruls'* Figure 2 represent image lines of a first field of a frame, and the solid lines represent

image lines of a second field of the same frame. Presumably, the central pixel of Figure 2 having

a luminance component P_t and a color component P_{tc} is the "at least one pixel" of the second

video image and luminance components M_1, M_2, M_3, and M_4, and color components M_{1c}, M_{2c},

M_{3c}, and M_{4c}, are the "plurality of pixels of the second video image spatially adjacent to the at

least one pixel. It is unclear from the identified Figures 1 and 2 or their associated descriptions

in Paragraphs [0026-0027] where teaching of the Claim 1 recitation of "selecting a first set of

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pixels including the at least one pixel and a plurality of pixels of the second video image spatially adjacent to the at least one pixel" is found.

There are other figures and paragraphs of *Bruls* that could be considered, but even these are easily distinguished from the present claims. For example, *Bruls'* Figures 5 and 7 appear to illustrate a temporal-spatial filtering. See Paragraphs [0007-0015] and [0047-0054]. Both Figures 5 and 7 illustrate a subject pixel P_t of a first frame and corresponding pixels P_{t1} and P_{t2} of other frames. In Figure 5, however, it is clear that only spatially corresponding pixels of one frame are considered, not the "first set of pixels" and "second set of pixels" of Claim 1. That is, the temporal relationship is computed from only one corresponding pixel of the other frames. See Paragraph [0047]. Further, the corresponding pixel of the other frames is the <u>original</u> pixel, not an "improved" pixel as recited in Claim 1. See Paragraph [0011].

Figure 7 of *Bruls'* moves even further from the invention of Claim 1. In addition to only processing multiple pixels of a single frame, the pixels of the various frames do not even come from the same field. *I.e.*, the difference in parity between pixels of *Bruls'* Figure 7 is evident from the solid line or dotted line on which the pixel sits. See Paragraph [0027].

As described above, *Bruls* does not teach several elements of Claim 1. The citations to *Bruls* found in the final Office Action do not teach "carrying out a digital filtering …" and do not teach "selecting a first set of pixels …." Further, even the un-cited portions of *Bruls* fail to teach the elements of Claim 1. While *Bruls* does contemplate temporal and spatial filtering, *Bruls* does not "carry out a digital filtering …." as required by Claim 1.

ii. ***Bagni* does not cure the deficiencies of *Bruls***

The addition of *Bagni* does not supply the missing elements of Claim 1. The final Office Action cited *Bagni* apparently to teach the Claim 1 element of "selecting a second set of pixels including pixels of the corresponding improved video image homologous with the pixels of said first set of pixels."

The aim of the *Bagni* invention is to provide motion prediction algorithms that are less complex than conventional algorithms. Col. 6, Lines 13-15. The passage of *Bagni* at Col. 7,

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Line 11 cited in the final Office Action is apparently used to show that pixels from sequential images are processed. *Bagni*, however, fails to teach the Claim 1 element of "selecting a second set of pixels including pixels of the corresponding improved video image homologous with the pixels of said first set of pixels."

As shown in *Bagni* in Table 2 and Figure 5, and as further described in Col. 6, Line 44 through Col. 7, Line 48, *Bagni* does not select any pixels from "the corresponding improved video image." Instead, *Bagni* builds prediction tables and then decimates certain predictors from the table based on how recurrent (or not recurrent) the predictors turn out to be. By calculating the success of particular predictors and then removing certain predictors from his calculations, *Bagni* accomplishes the stated aim of a less complex algorithm for motion compensation. That is, *Bagni* does not teach at all about selecting pixels from a "corresponding improved video image," so it is clearly not possible for *Bagni* to teach the element of "selecting a second set of pixels including pixels of the corresponding improved video image homologous with the pixels of said first set of pixels." Accordingly, since *Bagni* is only focused on an algorithm of reduced complexity for motion compensation, *Bagni* further does not teach any of the other elements of Claim 1.

iii. **The combination of *Bruls* and *Bagni* do not teach the elements of Claim 1**

Both *Bruls* and *Bagni* operate in the digital image processing field, but the combination fails to teach the elements of Claim 1. As described above, Claim 1 requires processing a first video image to obtain an improved video image with reduced noise. Claim 1 further requires processing at least one pixel of a second video image by selecting a first set of certain pixels of the second video image, selecting a second set of certain pixels of the improved video image (obtained from the first video image), and carrying out a digital filtering using pixels from the first and second sets. Claim 1 is allowable for at least the reason that neither *Bruls* nor *Bagni* alone or in any motivated combination teach the elements of Claim 1. That is, neither *Bruls* nor *Bagni*, alone or combined, improve a first video image, select a pixel and

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spatially adjacent pixels from a second video image, and select corresponding homologous pixels
from the improved first video image on which to carry out a digital filtering. Accordingly, the
rejections of Claim 1 are traversed, and withdrawal of the rejection is requested.

b. Claim 13

Claim 13 recites a "computer readable memory programmed to direct a filter …
operable in accordance with the method of claim 1." For at least the reasons that Claim 1 is
allowable, Claim 13 is in condition for allowance.

c. Claim 15

It is further apparent that even though the language of claim 15 is not identical to
that of claim 1, the nonobviousness of claim 15 will be apparent in view of the above remarks.
For example, claim 15 recites, *inter alia*, "processing a first image to generate an improved
image," "selecting a first pixel from the second, subsequent image …," "selecting a first set of
pixels in the second, subsequent image that have a predetermined spatial relationship to the first
pixel," "locating a second set of pixels in the first image that correspond …," and "filtering the
first pixel using data from both the first set of pixels and the second set of pixels."

In view of the remarks above, neither *Bruls* nor *Bagni,* alone or combined,
generate an improved first image, select a first pixel and set of pixels that have a predetermined
spatial relationship to the first pixel, and locate corresponding pixels from the improved first
image on which to carry out a digital filtering. Accordingly, the rejections of Claim 1 are
traversed, and withdrawal of the rejection is requested. Accordingly, Claim 15 is in condition for
allowance.

VI. Dependent Claims in General

Each dependent claim inherits the limitations of its respective base claim and all
intervening claims. Therefore, allowance of the respective base claim compels allowance of all

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dependent claims. See, *e.g.*, *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Accordingly, all
dependent claims, including those that were referenced in the Office Action and not specifically
referenced in the present response, are allowable for at least reasons of their respective base
claims, and the rejections should be withdrawn.

VII.   New Claims 17-20

In addition to the above, new dependent claims 17-20 have been submitted to
obtain coverage of additional embodiments. No new subject matter has been added. Support for
the new claims can be found generally in Figure 6 and in the written description, particularly
beginning on Page 16, Line 18 and following through Page 20, Line 13 of the application.

As new claims 17-20 depend from claim 1, which is believed to be allowable, it is
respectfully submitted that claims 17-20 are allowable.

VIII.   Conclusion

This RCE and amendment is made in order to reach agreement on the present
claims and have the case advanced to allowance. Overall, the *Bruls* reference alone, or with the
addition of *Bagni* or any of the other cited references in any motivated combination, does not
disclose, teach, or suggest what is recited in the independent claims. Thus, given the above
remarks, it is respectfully submitted that the presently rejected independent claims are in
condition for allowance. The dependent claims that depend directly or indirectly on these
independent claims are likewise allowable based on at least the same reasons and based on the
recitations contained in each dependent claim.

If a teaching in any of the cited references that is relevant to the allowability of
the claims has been overlooked, the Examiner is requested to specifically point out where such
teaching may be found. Further, if there are any informalities or questions that can be addressed
via telephone, the Examiner is encouraged to contact Mr. Satagaj at (206) 622-4900.

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All of the claims remaining in the application are now clearly allowable.

Favorable consideration and a Notice of Allowance are earnestly solicited.

The Director is authorized to charge any additional fees due by way of this
Amendment only, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC

___/Thomas J. Satagaj/_____
Thomas J. Satagaj
Registration No. 62,391

TJS:trl

701 Fifth Avenue, Suite 5400
Seattle, Washington 98104
Phone: (206) 622-4900
Fax: (206) 682-6031

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